

### Abstract

Methods for preparation from carbonate precursors the compounds of lithium transition metal oxides that include first the preparation of the carbonate precursors and then the preparation of the compounds of lithium transition metals oxide from the carbonate precursors are disclosed. The preparation of the carbonate precursors from transition metals nickel, cobalt, and manganese include the following steps: (1) Formulate a solution which combines a solution that contains a mixture of ions of chromium, nickel, and manganese with another solution that contains  $\text{CO}_3^{2-}$  ions; and (2) Combine the two solutions together to react and form the carbonate precursor,  $\text{Ni}_{1-x-y}\text{Co}_x\text{Mn}_y\text{CO}_3$ . The preparation of the compounds of lithium transition metal compound with transitional metal nickel, cobalt, and manganese include the following steps: (1) Mix  $\text{Li}_2\text{CO}_3$  with the  $\text{Ni}_{1-x-y}\text{Co}_x\text{Mn}_y\text{CO}_3$  precursor uniformly, calcine the mixture in air at 500-800°C for 2 to 20 hours; (2) Cool and pulverize said calcined material; (3) Calcine again said pulverized calcined material in air at 700 to 950°C for 2 to 30 hours; and (4) Cool, ballmill, and sift to obtain the compound of lithium transition metal oxide,  $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ .